

B. AMENDMENTS TO THE CLAIMS

Please amend the claims as reflected in the following listing of claims. *This listing of claims will replace all prior versions and listings of claims in the application.*

1. (Cancelled)
2. (Currently Amended) The transceiver module set forth in claim [[1]] 16, the active part being monolithically formed on the substrate.
3. (Currently Amended) The transceiver module set forth in claim [[1]] 16, the active part comprising a discrete laser diode and a discrete photo diode bonded to the substrate.
4. (Currently Amended) The transceiver module set forth in claim [[1]] 16, the active part being bonded with epoxy to the substrate.
5. (Currently Amended) The transceiver module set forth in claim [[4]] 16, the active part coupled to the circulator through free space.
6. (Currently Amended) The transceiver module set forth in claim [[1]] 17, the active part coupled to the circulator through at least one fiber-optic pigtail, the laser diode being coupled to the circulator through a polarization maintaining fiber.
7. (Currently Amended) The transceiver module set forth in claim [[1]] 17, the second port optically coupled to an output connector.

8. (Currently Amended) The transceiver module set forth in claim [[1]] 7, the output connector being at least one of small form factor, small form factor pluggable, and GBIC.

9. (Original) The transceiver module set forth in claim 8 further comprising an electronic interface coupled to the laser diode and the photo diode, the electronic interface comprising circuitry for converting electronic data signals into a driving signal for driving the laser diode and for converting signals from the photo diode to electronic data signals.

10. (Currently Amended) The transceiver module set forth in claim [[1]] 9 the electronic data signals being 10 Gigabit Ethernet.

11-15. (Cancelled)

16. (Currently Amended) ~~The transceiver module set forth in claim 1 wherein the circulator comprises:~~ A transceiver module for both transmitting and receiving optical data over single fiber-optic cable in a fiber-optic network, the transceiver module comprising:

a substrate;

an active component part comprising a laser diode and a photo diode disposed on the substrate; and

a circulator disposed on the substrate and optically coupled to the active component part, the circulator having a first port optically coupled to the laser diode, wherein optical data input at the first port is output at a second port, the second port for transmitting and receiving optical data from the fiber-optic network, where optical data input at the second port is output at a third port that is optically coupled to the photo diode, the circulator further including:

a plurality of polarization beam splitters;

a plurality of garnets in optical communication with the plurality of polarization beam splitters;

at least one waveplate in optical communication with the plurality of polarization beam splitters and the plurality of garnets; and

at least one mirror in optical communication with the plurality of polarization beam splitters, the plurality of garnets and the at least one waveplate.

17. (Currently Amended) ~~The transceiver module set forth in claim 1 wherein the circulator comprises:~~ A transceiver module for both transmitting and receiving optical data over single fiber-optic cable in a fiber-optic network, the transceiver module comprising:

a substrate;

an active component part comprising a laser diode and a photo diode disposed on the substrate; and

a circulator disposed on the substrate and optically coupled to the active component part, the circulator having a first port optically coupled to the laser diode, wherein optical data input at the first port is output at a second port, the second port for transmitting and receiving optical data from the fiber-optic network, where optical data input at the second port is output at a third port that is optically coupled to the photo diode, the circulator further including:

a polarization beam splitter;

a waveplate optically coupled to the polarization beam splitter;

a garnet optically coupled to the waveplate; and

a beam displacer optically coupled to the garnet.

18. (Currently Amended) ~~The transceiver module set forth in claim 1 wherein the circulator comprises:~~ A transceiver module for both transmitting and receiving optical data over single fiber-optic cable in a fiber-optic network, the transceiver module comprising:

a substrate;

an active component part comprising a laser diode and a photo diode disposed on the substrate; and

a circulator disposed on the substrate and optically coupled to the active component part, the circulator having a first port optically coupled to the laser diode, wherein optical data input at the first port is output at a second port, the second port for transmitting and receiving optical data from the fiber-optic network, where optical data input at the second port is output at a third port that is optically coupled to the photo diode, the circulator further including:

a first waveplate;

a first beam displacer optically coupled to the first waveplate;

a second waveplate optically coupled to the first beam displacer; and

a second beam displacer optically coupled to the second waveplate.

19. (Currently Amended) In an optical network environment, a method of fabricating a bi-directional transceiver module, the method comprising:

providing a substrate;

attaching an active component part to the substrate, wherein the active component part includes a laser and a photodiode; and

attaching a circulator on the substrate such that a first port of the circulator is coupled with the laser and wherein a second port of the circulator is coupled with the photodiode, wherein the circulator includes:

a garnet that is disposed between a first wedge and a second wedge; and

a magnet that at least partially encloses the garnet, the first wedge, and the second wedge.

20. (Cancelled)

21. (Original) The method as set forth in claim 19, further comprising coupling the first port to the laser through free space.

22. (Original) The method as set forth in claim 19, further comprising coupling the first port to the laser thorough free space and coupling the second port to the photodiode through a fiber optic pigtail.

23. (Currently Amended) The method as set forth in claim 19, further comprising coupling the laser to the circulator through a polarization maintaining fiber-optic pigtail.

24. (Original) The method as set forth in claim 19, wherein attaching an active component part to the substrate further comprises fabricating the active component part monolithically onto the substrate.

25. (Original) The method as set forth in claim 19, wherein attaching an active component part to the substrate further comprises attaching discrete components to the substrate.

26. (Cancelled)

27. (Currently Amended) A transceiver module as defined in claim [[26]] 31, wherein the distance between the laser diode and the photo diode is less than 300 microns.

28. (Currently Amended) A transceiver module as defined in claim [[26]] 31, wherein the distance between the laser diode and the photo diode is about 200 microns.

29. (Currently Amended) A transceiver module as defined in claim [[26]] 31, wherein the length of the transceiver module is less than .75 inches.

30. (Currently Amended) A transceiver module as defined in claim [[26]] 31, wherein the length of the transceiver module is about .5 inches.

31. (Currently Amended) ~~A transceiver module as defined in claim 26~~ A transceiver module for both transmitting and receiving optical data over single fiber-optic cable in a fiber-optic network, the transceiver module comprising:

an active component part including a laser diode and a photo diode disposed on a substrate that are separated by a distance, wherein the distance between the laser diode and the photo diode determines a length of the transceiver module; and

a core that is connected to the laser diode over a polarization maintaining fiber and to the photo diode over a single mode fiber, wherein the core transmits light from the laser diode to a fiber optic cable over a first path through the core and transmits light received from the fiber optic cable to the photo diode over a second path through the core, wherein the core includes a garnet that is disposed between a first wedge and a second wedge.

32. (Original) A transceiver module as defined in claim 31, wherein the core is enclosed by a magnet.

33. (Original) A transceiver module as defined in claim 31, wherein the core further comprises:

a first lens disposed between the first wedge and the active component part; and
a second lens disposed between the second wedge and the fiber optic cable.